

subject, and subsequently presents another part; or the case where new facts are first published in a scientific journal and then worked over into popular form for the weekly press or any ephemeral publication. We are not thinking of these, but of the presentation of scientific facts in different journals, society reports, etc., under various guises, without adequately stating where and how they previously appeared. The neglect to take this precaution, when publication through one medium is not deemed sufficient, as usually ought to be the case, leads to much confusion and annoyance when another investigator goes over the same ground, and also has the effect of lowering the standard of appreciation with which thoughtful persons regard the author's writings. It suggests the idea that the author must be deficient in solid facts, or he would not require so much service of those he brings forward; and unpleasant suggestions also present themselves regarding the author's motives in thus using his material over and over. It may be supposed that scientific men of eminence would never fall into such practices, and yet conspicuous examples are not wanting.

OPEN LETTERS.

Vitality of seeds.

About twenty years ago, when "White Hall," upon the grounds of the Maine State College was built, the excavated dirt was used to make a fill, covering the surface of the ground four or five feet. This year, to lay some sewer pipes, a ditch was cut through the old fill, and along the side of the ditch, four feet below the present surface, seeds in considerable numbers germinated.

The plants did not develop sufficiently before the ditch was filled to determine the species.

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The old and new botany.

In the April number of your magazine, the editorial on the methods of teaching botany attracted my attention. While heartily agreeing with the general sentiment expressed, I wish to offer some criticism, or call attention to that aspect of the new method which is considered, in some quarters at least, as the only true biological method.

You close the article with the sentence, "The botanical teaching of the future will consider these, not as two opposing methods, but as complementary, both essential to the rounding out of a botanical course." This implies that at the present time these two methods, the old and the new, may be considered as opposing each other. It seems to me we do not need to wait for the future to teach us that there can be no real opposition between them, for according to their definition in the editorial they refer simply to different departments of the same science. By the old method is meant the teaching of systematic botany, by the new, the teaching of types and the grounding in biological (physiological?) prin-

ciples. But biological work appears sometimes to be regarded as a science distinct from both botany and zoology, so that one not unfrequently hears of courses being planned in botany, zoology *and* biology, as though botany and zoology failed to recognize plants and animals as living things! Now this is what I do not believe, and it is this monopoly of vital phenomena set up by biologists for biology to which I object.

Now the new method, which is often referred to as the biological one, is supposed to include what is left out in the old, since they complement each other.

While I am unwilling to call it a *method* of teaching, it seems particularly unfortunate to call it the biological method. This word, as I understand it, belongs to the science by virtue of the objects considered being living things, therefore it is illogical to consider any department of botany as entirely unconnected with biology. To explain more fully, classification is based on morphology, or the doctrine of forms, the forms of the organs by which the plant is able to carry on its own existence and to reproduce its kind. It is as idle to consider the vital processes independently of the organs which exhibit them as it would be to ignore the functions of organs by dealing alone with their forms.

The opposition supposed to exist between the old and the new methods is the result of this misuse of the term biological, and it works harm in two ways: First, those wishing to take up the study of botany are deceived by supposing that there is a short, easy, new method, by which they are going to be led straight to the heart of the science without the tedious circumlocution of learning the names of things. It is natural that they should reject and oppose what they consider the old fashioned way. Secondly, this use of the term, biological method, is apt to lead to misunderstanding on the part of students, well educated in other respects, who are not especially interested in the biological sciences. To such the word protoplasm is destined to call up ideas of life-manifestations in which animals and plants either have no part or are inextricably confused.

As long as botanists are willing to suffer the most important part of botanical teaching to be referred to in such vague terms as to effectually disguise its real nature and even mislead educated people into supposing it can only be taught in connection with the science of animal life, so long will they find it difficult to give to botany the rank which it deserves. In France and Germany the study of the vegetable kingdom has been recognized, for some years, as a distinct science, including several departments; the terms, physiological, anatomical, morphological (which includes systematic botany), being used in a similar manner as in connection with zoology. In my judgment, if we were to follow their example and use these or similar terms when speaking of the different departments of botany it would do much toward obviating the two evils referred to. It would certainly help to place the science on a level with other natural sciences in the minds of those not especially interested, and would have some influence, perhaps, in rescuing botany from the general disfavor into which it appears to be falling. When the different parts of botany are not only referred to but taught in the way suggested, so that a general course will include a knowledge of all its departments, and an advanced course, continued study in any one or more of them, there will be no possibility of opposition, except the natural and healthful one of competition between those striving to do their best in their chosen fields.

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